

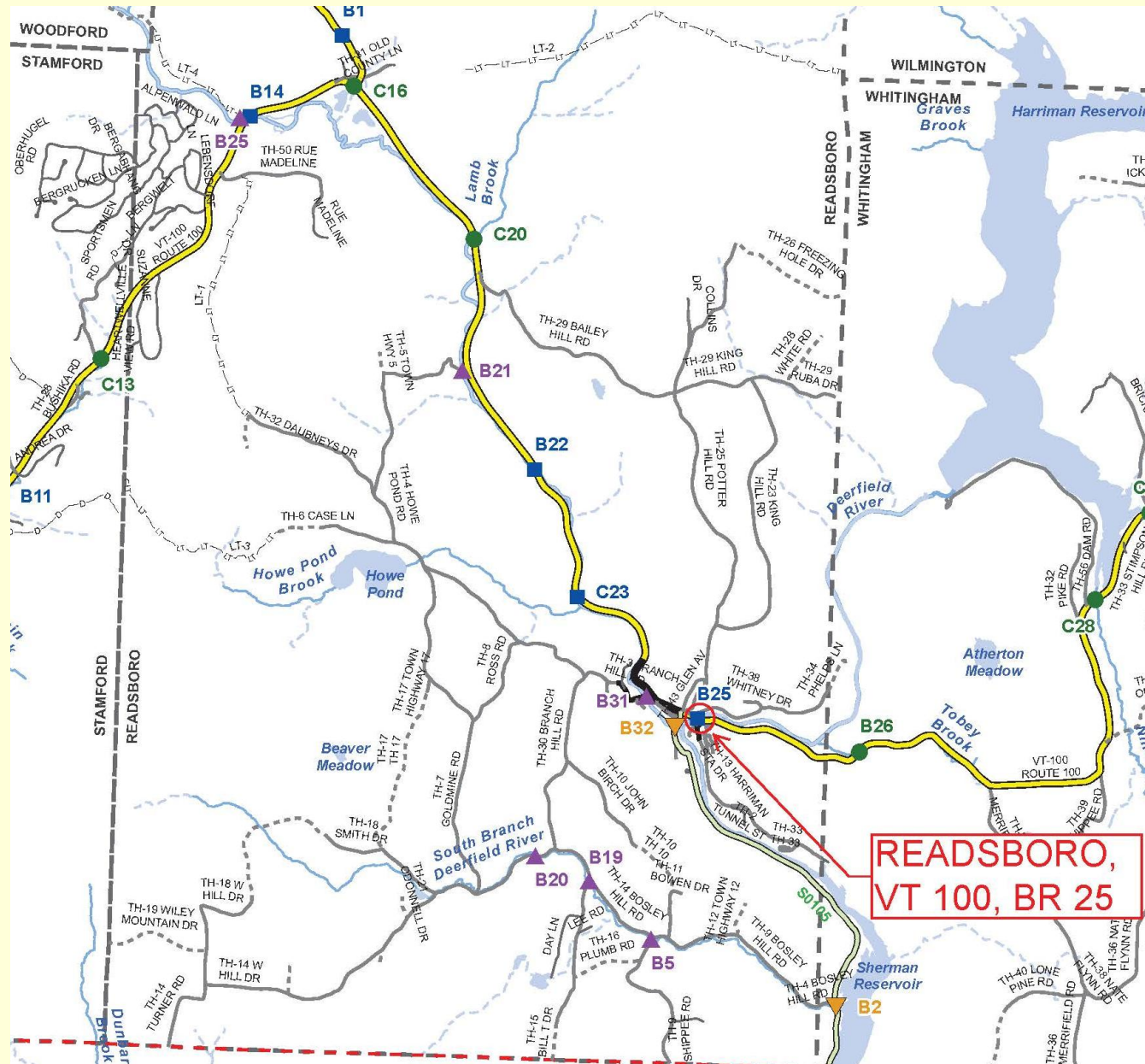
# **Readsboro BF 0102(16) Bridge 25 on VT Route 100 over the Deerfield River Regional Concerns Meeting**



**Presented by  
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# PROJECT LOCATION



# Meeting Outline

- Purpose of the Meeting
- Structures Section Re-organization
- Existing bridge deficiencies
- Alternatives considered
- Summary and recommendation
- Next Steps

# Purpose of Meeting

- Present the alternatives that we have considered
- Explain the constraints to the project
- Help you understand our approach to the project
- Provide you with the chance to ask questions
- Provide you with the chance to voice concerns
- Build consensus for the recommended alternative-

# Accelerated Bridge Program

- Began in January 2012
- Bridges are deteriorating faster than we can fix them
- Short-term closures are key
- Impacts to property owners and resources is minimized
- Less impacts = less process = less money = faster delivery
- Accelerated Bridge Construction (ABC) is very efficient
- Accelerated Project Delivery is the result
- Shift from individual projects to programmatic approach
- Goal of 25% of projects into Accelerated Bridge Program
- Goal of 2 year design phase for ABP (5 years conventional)

# Project Initiation & Innovation Team

- Part of re-organization in January 2012
- All Structures projects will begin in the PIIT
- Very efficient process
- Look for innovative solutions whenever possible
- Involved until Project Scope is defined
- Hand off to PM to continue Project Design phase

# Phases of Development

Project  
Funded

Project  
Defined

Contract  
Award

Project Definition

Project Design

Construction

Identify resources &  
constraints

Evaluate alternatives

Public Participation

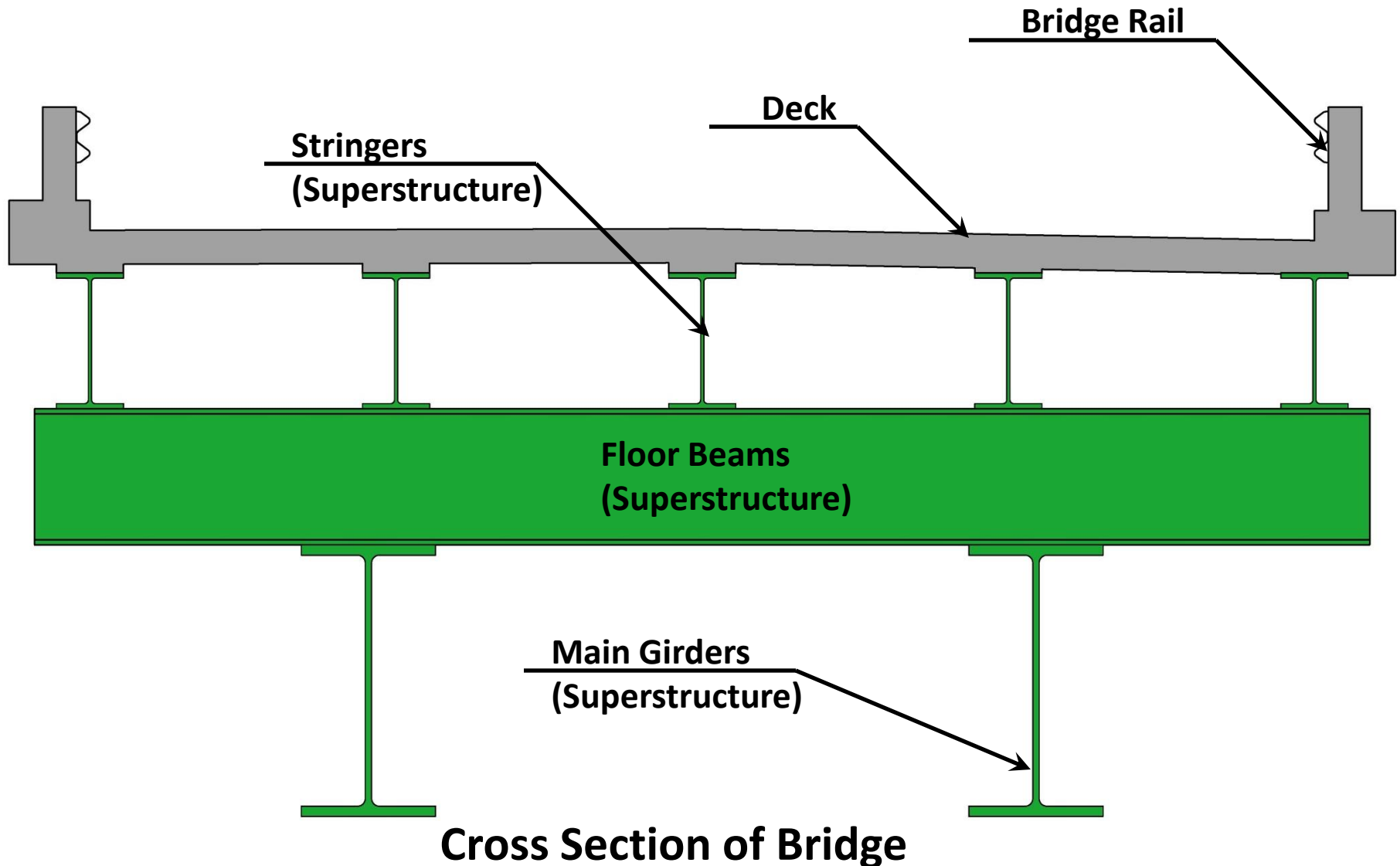
Build Consensus

- Quantify areas of impact

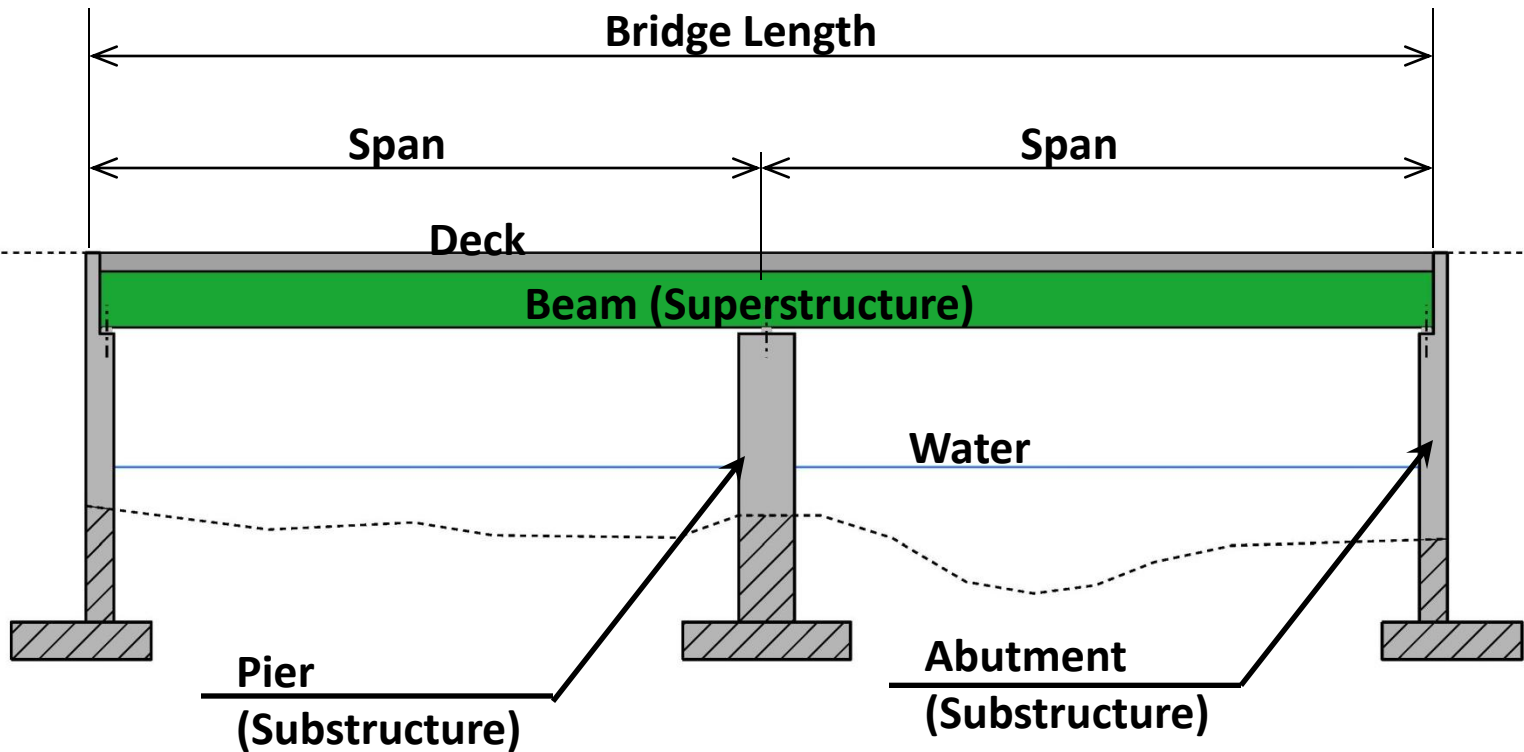
- Environmental permits

- Develop plans, estimate and specifications

# Description of Terms Used



# More Terms Used



**Elevation View of Bridge**

# Project Background

- The structure is owned and maintained by the State
- Funding will be 80/20 Federal/State (no local funds)
- The Town will be responsible for the cost of any work associated with the existing water line
- Functionally labeled as a Rural Major Collector
- Posted Speed = 40 mph (Design Speed)
- Existing bridge is a three-span – 2 Girder system
- Bridge length = 340 feet (105'-130'-105')
- Bridge Width = 28.5 feet (w/ 5' sidewalk)
- The bridge was built in 1954 (59 years old)

# Traffic Data

	<b>“Current Year” 2016</b>	<b>“Design Year” 2036</b>
<b>Average Annual Daily Traffic</b>	<b>1,000</b>	<b>1,100</b>
<b>Design Hourly Volume</b>	<b>110</b>	<b>120</b>
<b>Average Daily Truck Traffic</b>	<b>140</b>	<b>200</b>
<b>%Trucks</b>	<b>16.3</b>	<b>21.2</b>

# EXISTING BRIDGE DEFICIENCIES

## Inspection Rating Information (Based on a scale of 9)

Bridge Deck Rating	3 Serious
Superstructure Rating	4 Poor
Substructure Rating	6 Satisfactory

## Rating Definitions

9 Excellent  
8 Very Good  
7 Good  
6 Satisfactory  
5 Fair  
4 Poor  
3 Serious  
2 Critical  
1 Imminent Failure

## Deficiencies

- The bridge is structurally deficient with the deck rated 3 and the superstructure rated 4.
- The bridge and approach railing are substandard
- The vertical and horizontal alignments are substandard

# Looking east over Bridge



# Looking west over Bridge



# Floor System showing bottom of deck



04/16/2012

# Looking under the bridge at deck and beams

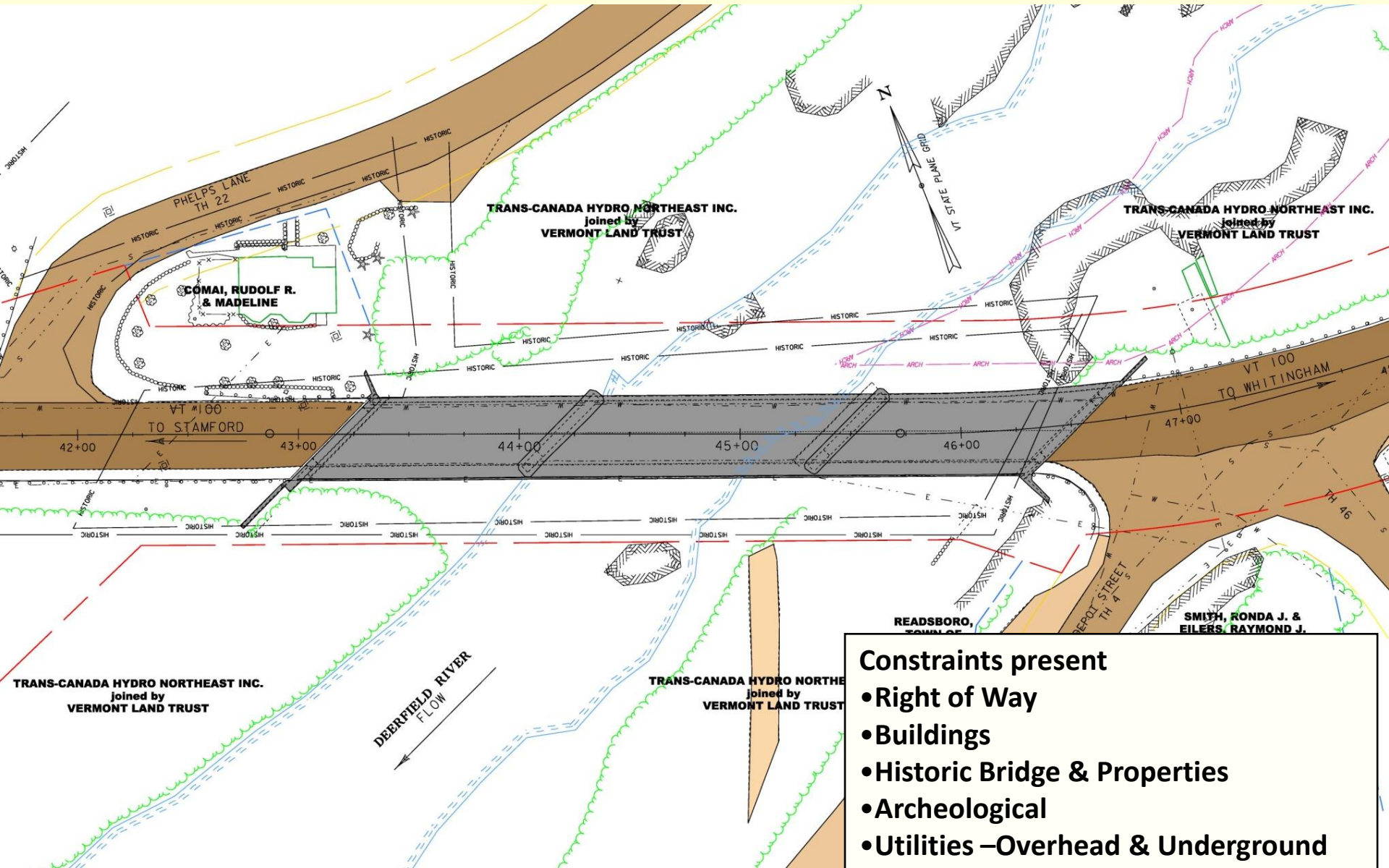


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# Perforated Steel Beam



# Layout Showing Constraints



# Alternatives Discussion

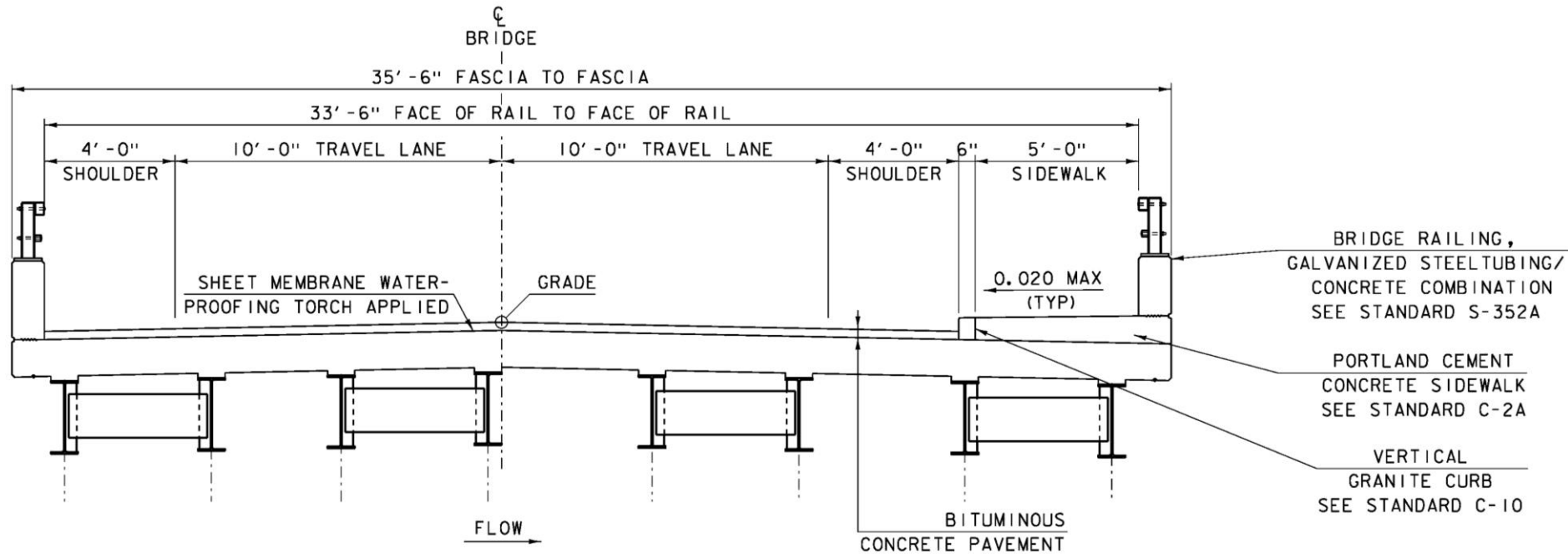
- Superstructure Replacement
- Complete Bridge Replacement w/ Single span bridge
- Complete Bridge Replacement w/ Three span bridge

Note: The method to maintain traffic during construction will be considered separately later in the presentation

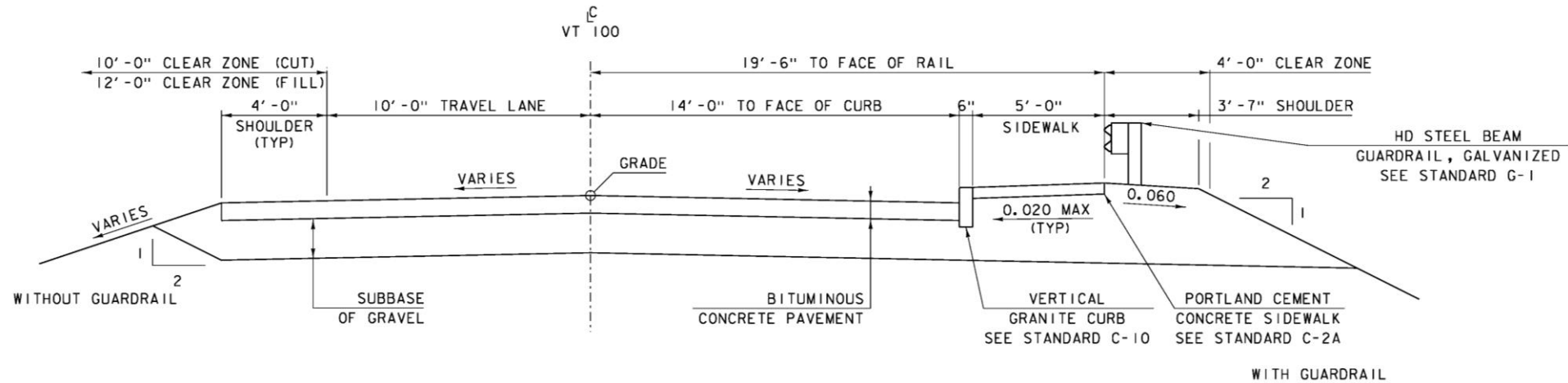
# **Common Details for all Alternatives**

- Maintain the existing horizontal alignment
- Maintain the existing vertical alignment
- Match existing typical of 4-10-10-4-5.5 (28' curb to curb)

# Bridge Typical



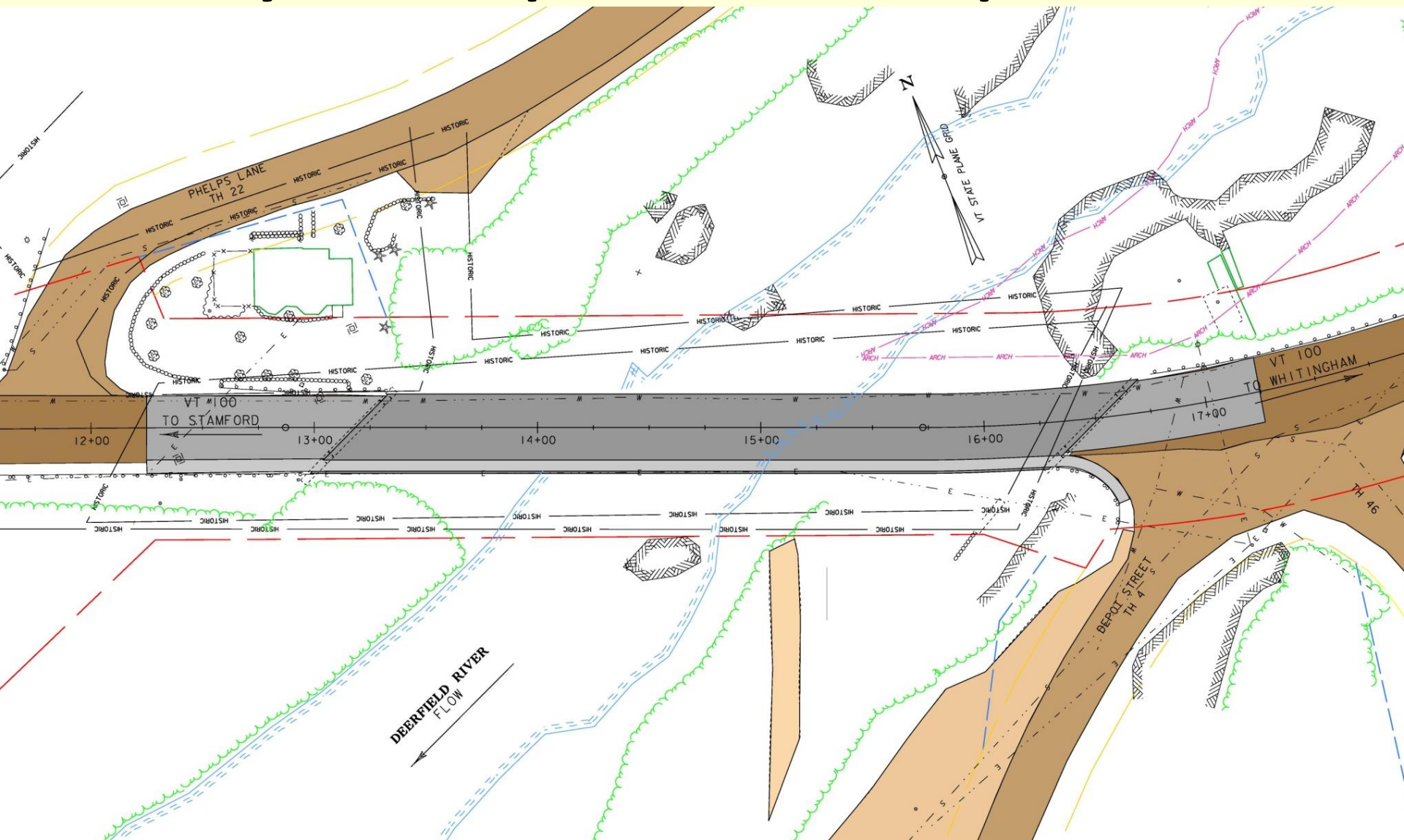
# Roadway Typical



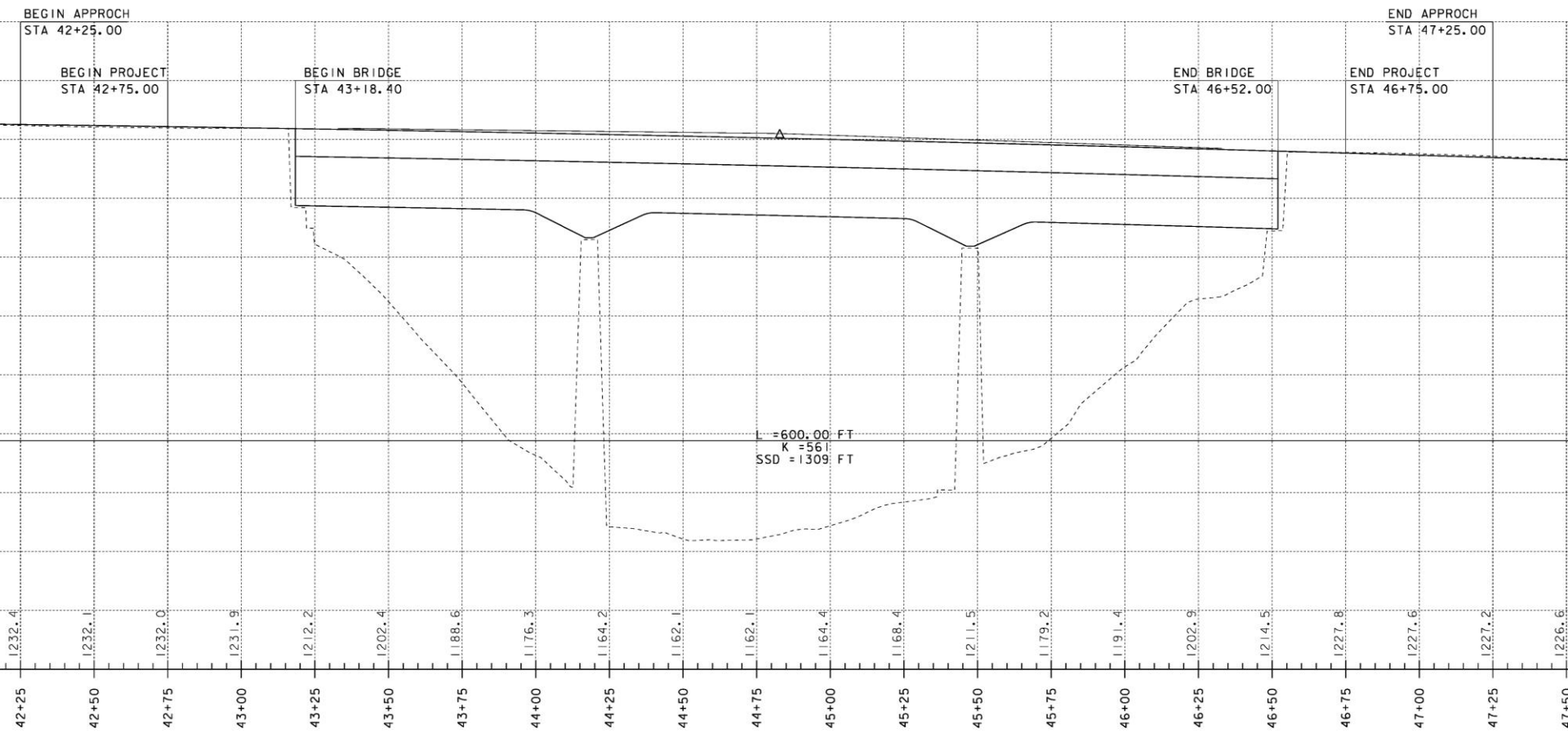
# Superstructure Replacement

- Replace entire superstructure (beams and deck)
- Match existing typical
- Modify/strengthen piers for new superstructure
- All structural problems would be addressed
- Some substandard features would remain
- Moderate-term (40 year) solution

# Layout – Superstructure Replacement



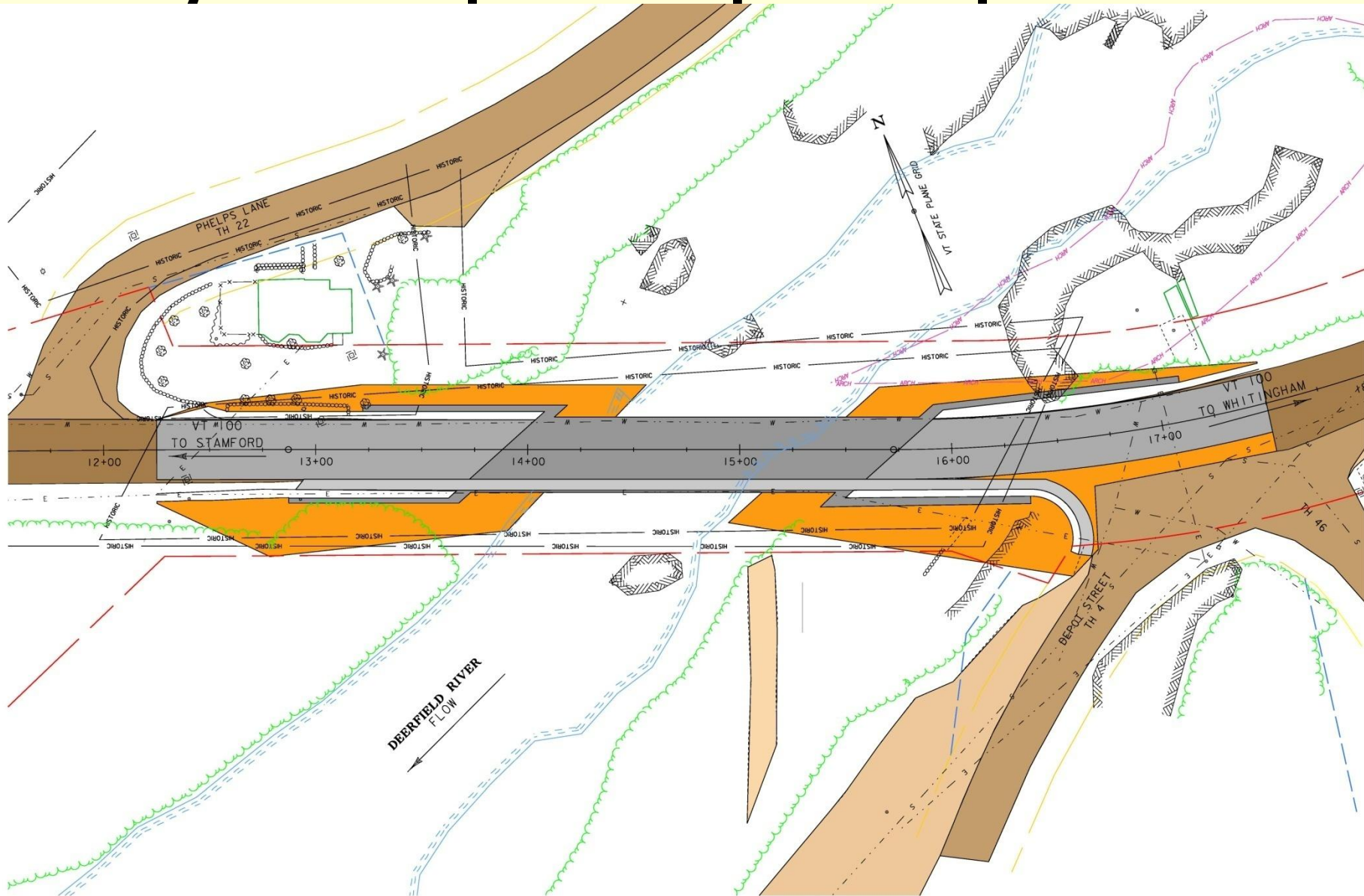
# Profile - Superstructure Replacement



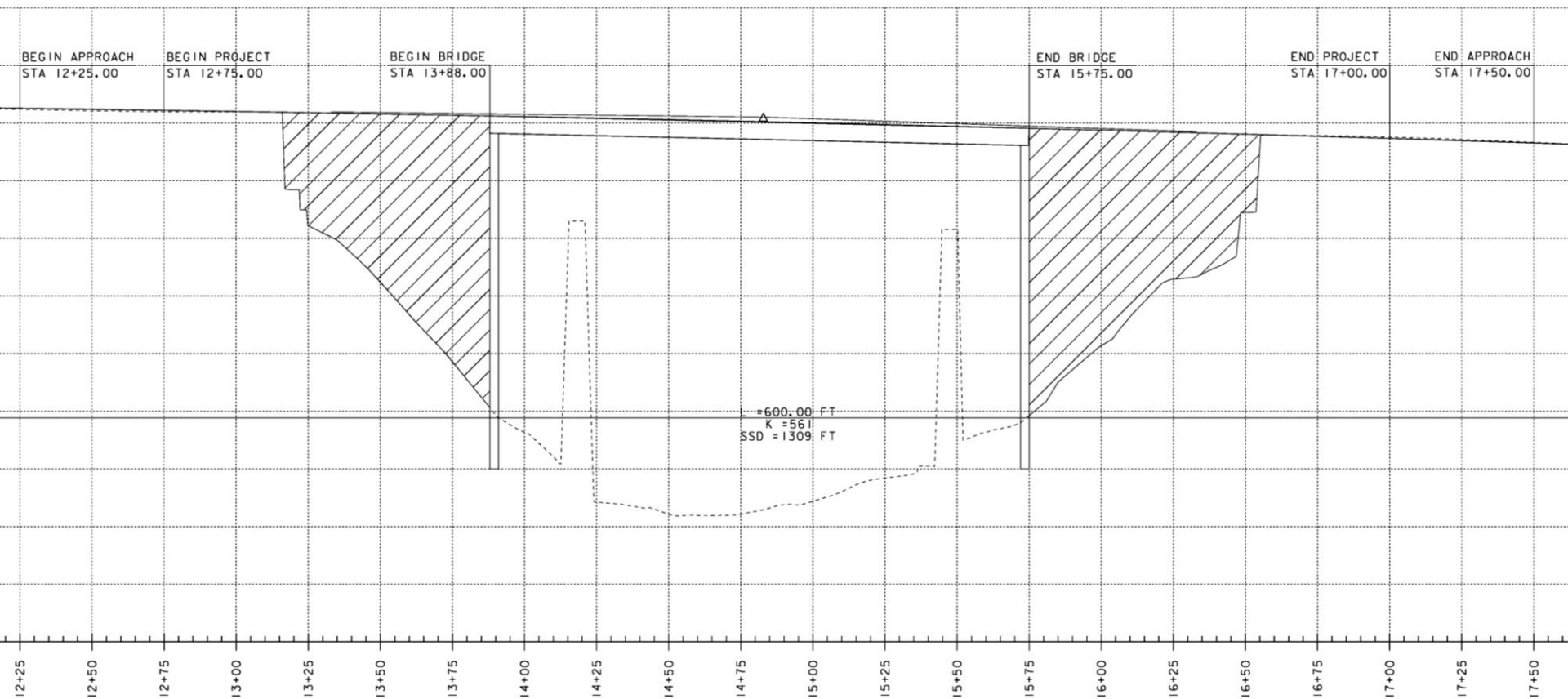
# Complete Replacement Single Span

- 187' span w/ 42 degree skew
- Match existing typical
- Maintain existing alignment
- Long term (80 year) solution

# Layout – 1 span Complete Replacement



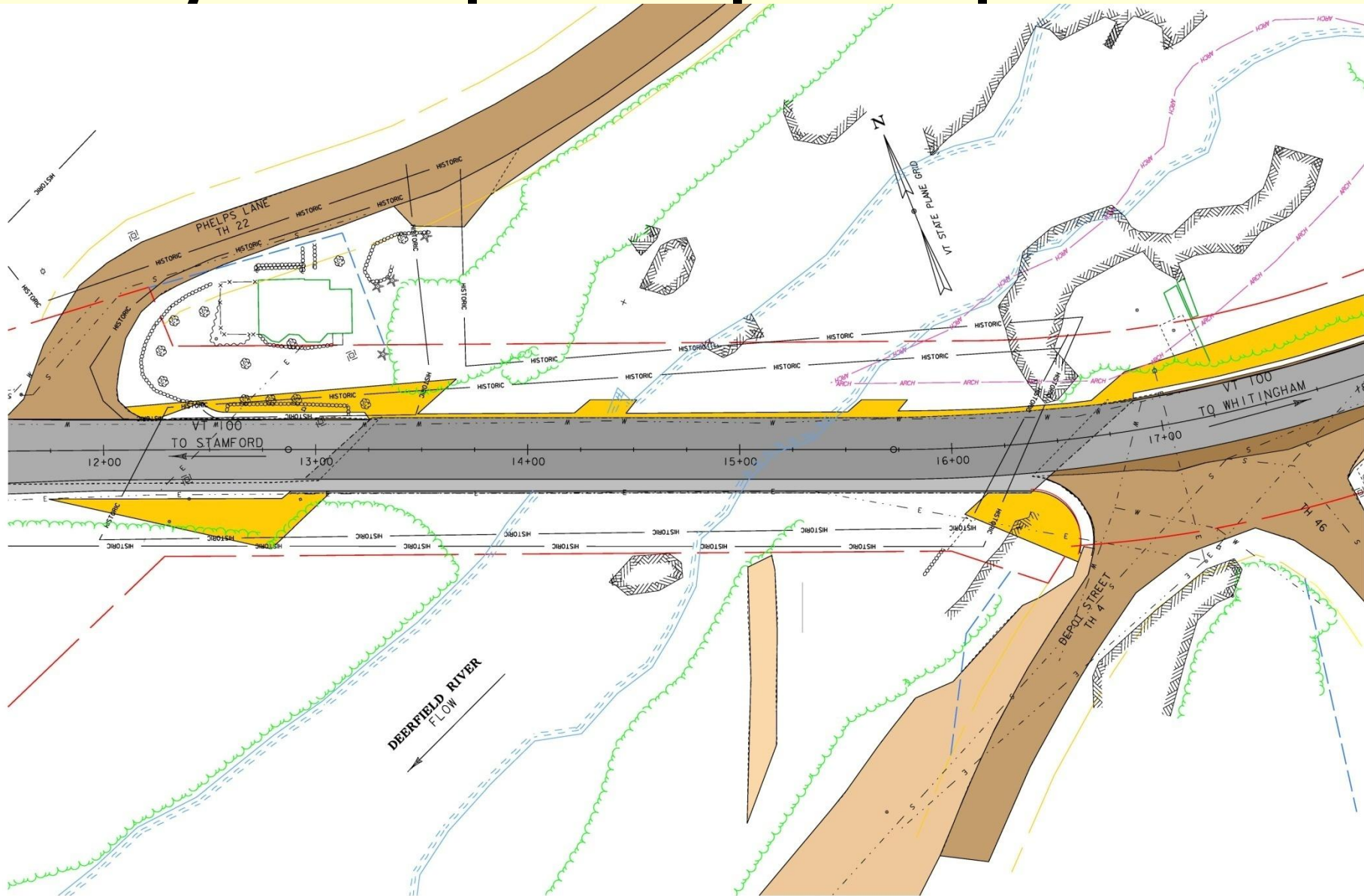
# Profile - 1 Span Complete Replacement



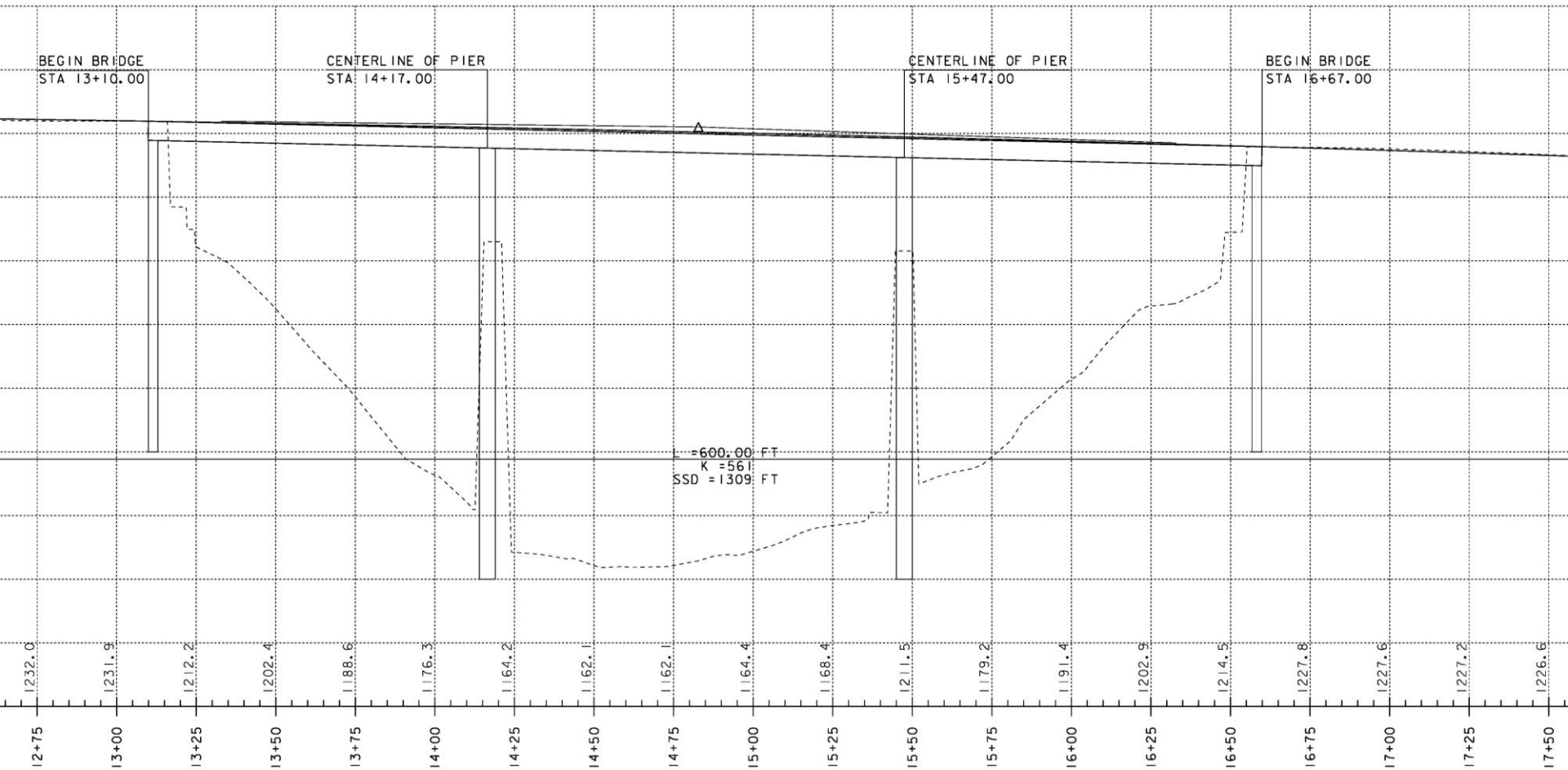
# Complete Replacement Three Span

- 357' total bridge length w/ 42 degree skew
- Match existing typical
- Maintain existing horizontal alignment
- Long term (80 year) solution

# Layout – 3 span Complete Replacement



# Profile - 3 Span Complete Replacement



# Methods to Maintain Traffic

Three general methods available:

- Phased Construction
- Temporary Bridge
- Short-term bridge closure w/ off-site detour & ABC

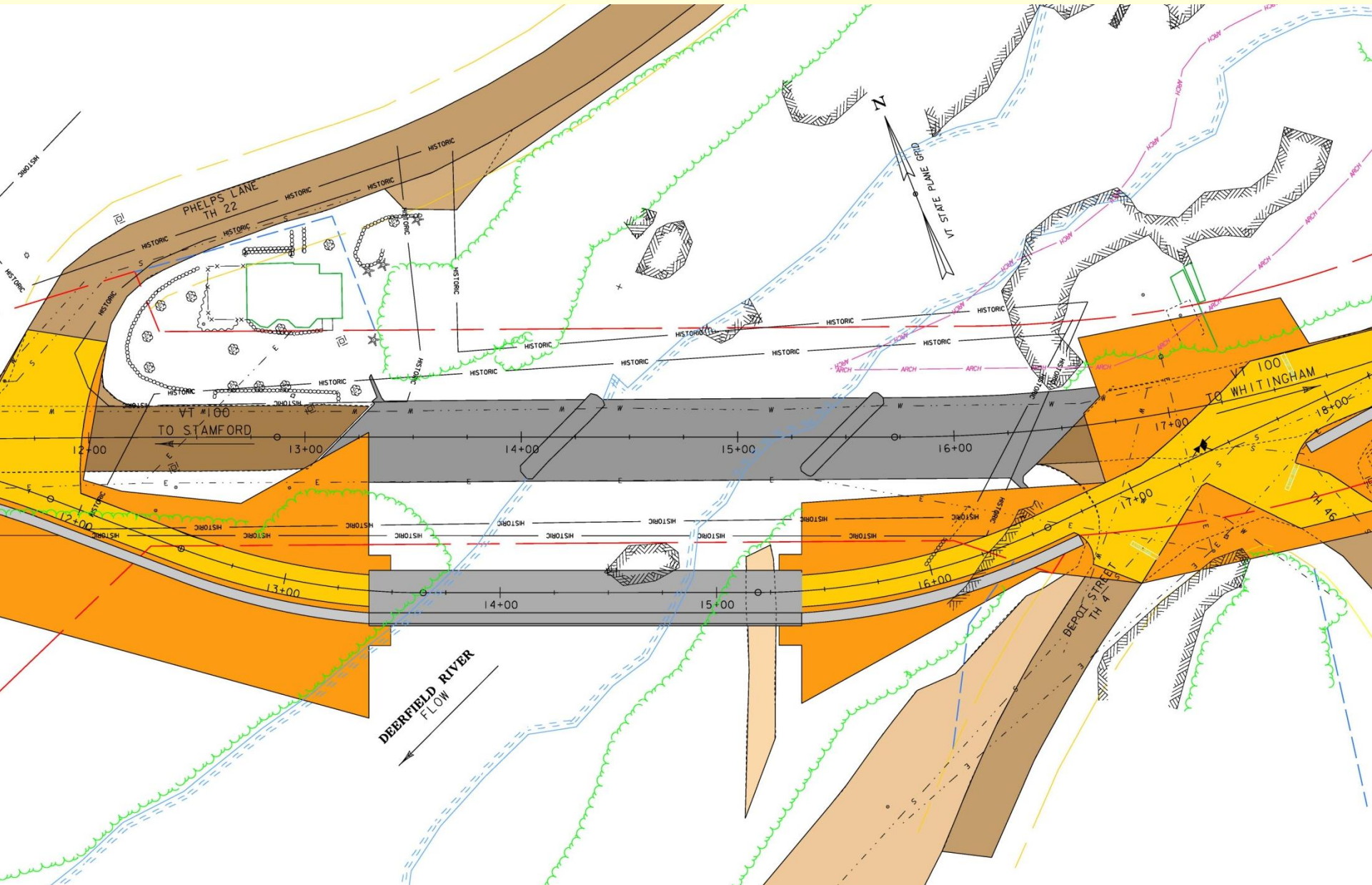
# Phased Construction Option

- Build half new bridge while traffic is on half of old bridge
- Switch traffic on new bridge portion
- Build remainder of new bridge
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Relatively long construction duration
- Workers & motorists in close proximity – safety concerns
- Can usually be done without ROW acquisition
- **Ruled out since this is a non-redundant 2-Girder system**

# Temporary Bridge Option

- Construct temporary bridge to maintain traffic
- One-Way alternating traffic with lights
- Queue lengths and queue times can be inconvenient
- Access to side drives/buildings needs to be considered
- Very long construction duration
- Right-Of-Way acquisition is necessary
- Environmental impacts are increased
- Property owner impacts are increased
- Project Delivery time increased
- Project Costs increased-

# Layout - Temporary Bridge Downstream



# Accelerated Bridge Construction with Bridge Closure Option

- Bridge 25 to be closed for 3 weeks (or 3 months for complete replacement)
- Allow 24/7 construction during bridge closure
- Contract incentives/dis-incentives to encourage contractor
- Contractor will receive more \$ if closure is less than stated in the contract
- Community would have input on time of closure (between June 1 and September 1)
- Detour would be on State highways
- Public Outreach to provide advance notice for planning-

# Detour Route



A to B on Thru Route: 13.5 Miles

C to B on Detour Route: 18.6 Miles

Added Miles: 5.1 Miles

End to End Distance: 32.2 Miles

## Major Factors

Added Miles: 5.1

Traffic Volume: 1,000 vpd

Duration: 3 weeks (or 3 months)

# Concerned Stakeholders for Bridge Closures

A few groups we commonly hear concerns from:

- Businesses who lose drive-by traffic during the closure
- Schools who have a bus route over the closed bridge
- Motorists who have to travel a longer distance on the detour
- Emergency responders who have to respond quickly
- Owners living near the construction who are concerned with noise
- Owners living along a bypass route that will see increased traffic
- Municipalities who have increased impact to their local roads

# Mitigation Strategies for Bridge Closures

Some ideas on how these impacts are often mitigated:

- Allow municipality input on time of year for closure
- Accelerated construction duration including:
  - Allowance for working 24 hours per day and 7 days per week
  - Incentive/Dis-incentive clause to encourage the contractor (\$\$)
- Noise limits included in contract for night time work
- Municipalities are compensated for bypass impacts
- Signing to notify motorists of business districts open for business
- Grant assistance from Agency of Commerce & Community Development
- Many examples of creative solutions from people impacted-

# Alternatives Matrix

	Superstructure Replacement w/ Detour	Replacement - Single Span w/ Detour	Replacement - Single Span w/ Temp Bridge	Replacement – Three Span w/ Detour	Replacement – Three Span w/ Temp Bridge
Construction w/ CE + Contingencies	\$3,228,000	\$6,096,000	\$7,690,000	\$6,000,000	\$7,598,000
Preliminary Engineering	\$548,000	\$1,066,000	\$1,345,000	\$1,050,000	\$1,330,000
Right of Way	\$0	\$0	\$345,000	\$0	\$345,000
<b>Total Project Cost</b>	<b>\$3,776,000</b>	<b>\$7,162,000</b>	<b>\$9,380,000</b>	<b>\$7,050,000</b>	<b>\$9,282,000</b>
Design Life	40 Years	80 Years	80 Years	80 Years	80 Years
Project Development Duration	2 years	2 years	4 years	2 years	4 years
Construction Duration	3 months	2 years	3 years	2 years	3 years
Closure Duration	3 weeks	3 months	None	3 months	None

# Conclusion and Recommendation

## Superstructure Replacement w/ 3 week closure & detour

- Project Delivery can be expedited – we want to decide when to close the bridge
- Addresses the structural concerns of deck and beams
- Obtaining easements for temporary bridge will add years to development process
- Closure minimizes impacts to property owners and environmental resources
- Moderate-term (40 year) solution

## **Next Steps**

This is a list of a few important activities expected in the near future and is not a complete list of activities.

- Meet to discuss comments from this public meeting
- Decide how to proceed and document
- Develop Conceptual Plans
- Hold public meeting if needed based on alternative
- Historic permitting process
- PROJECT DEFINED milestone
- Develop Preliminary Plans
- Environmental permitting
- Utility relocation

# Questions



**Direct any questions to:**

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**This presentation is available at the  
web address shown below**

**<https://outside.vermont.gov/agency/vtrans/external/Projects/Structures/13C068>**